REMARKS

Claims 1-33 have been cancelled. New claims 34-55 have been added and are now active in this case.

REQUEST FOR RECONSIDERATION

In an effort to reduce emission of hydrocarbons from parts of vehicular fuel systems, it is presently known to subject the parts to a fluorination treatment to render the parts less permeable to hydrocarbon. Unfortunately, the use of either the fluorination treatment or fluorocarbon rubbers in such treatment adds a significant increase in cost of manufacturing of these parts.

Quite surprisingly, in accordance with the present invention, it has been discovered that an acceptable reduction in the emission of hydrocarbons from vehicular fuel systems can be obtained by coating fuel system parts in contact with hydrocarbons with a thin coating of polytetrafluoroethylene (PTFE). In part, the present invention provides a part for a motor vehicle, which part contains a portion containing plastic or rubber and a polytetrafluoroethylene coating on the surface of the portion containing plastic or rubber which is in contrast with the hydrocarbons, wherein the coating has a thickness of up to a few tens of microns and is sufficient to reduce emission of hydrocarbons through the component to no more than 2g/24 hours[1]. Such a reduced emission is increasingly required in many countries by law.

The present invention also provides, in part, a method of reducing emission of hydrocarbons through a part of a motor vehicle, component containing plastic or rubber, which entails coating polytetrafluoroethylene on a surface of the part in contact with the hydrocarbons, the coating having a thickness of up to a few tens of microns, which is sufficient to reduce hydrocarbon transmission to not more than 2g/24 hours.

Thus, the present invention utilizes a thin inner coating of up to a few tens of microns thickness of PTFE on the surface of plastic or rubber parts which either house or transport hydrocarbon-based fuels, whereby the emission of vaporous hydrocarbon through the part is greatly reduced.

Claims 1, 4-6, 20 and 27-29 stand rejected under 35 USC 102(b) as being anticipated by

[1] It meets the Euro 200o standard for emission of hydrocarbons over an entire motor vehicle.

Washizu (4,800,109). However, this reference fails to either disclose or suggest the present invention.

Notably, Washizu merely describes a composite hose for use as a fuel line component in automobiles, which contains an inner layer made of synthetic resin which may be polytetrafluoroethylene. See column 1, line 65 - column 2, line 10.

Specifically, Washizu describes an inner tube for a composite hose, which inner tube is made of:

> ...a synthetic resin having flexibility and high oil resistance, chemical resistance, and pressure resistance. It includes, for example, polyamide resins and fluoroplastics.

Washizu describes the use of the many polyamides and fluoropolymers of which PTFE is merely one. See col. 2, lines 1-10.

This reference teaches that the outer tube of the composite hose is "made of a heat-shrinkable synthetic resin." See col. 2, lines 11-12. Examples of the heat-shrinkable synthetic resin are "crosslinked polyolefins, fluoroplastics and synthetics rubbers." See col. 2, lines 18-19.

However, the present invention seeks to avoid the use of large amounts of expensive fluororubbers as taught by this reference. While Washizu teaches a composite having a thick inner layer of expensive fluoroplastics, for example, in contrast, the present invention teaches the use of inexpensive plastic or rubber having only a relatively thin coating of polytetrafluoroethylene thereon as an inner layer. Specifically, as noted in Example 1 of this reference, a polytetrafluoroethylene inner layer of about 500μm (0.5mm thick) is taught. This is far thicker than is required in accordance with the present invention as an inner layer of only up to a few tens of microns thick.

Thus, it is quite clear that one skilled in the art would not be motivated from this reference to practice the present invention. Specifically, there is no instruction or even a remote suggestion in the reference to use a thin, internal coating of polytetrafluoroethylene on conventional rubber or plastic with a thickness of only up to several tens of microns.

This is particularly so inasmuch as the function of the inner layer in Washizu is to

provide oil resistance, chemical resistance and pressure resistance. See col. 1, lines 66-67. This reference mentions nothing whatsoever regarding reduction of hydrocarbon emissions from a part which houses or transports fuels containing hydrocarbons for a motor vehicle. Oil is certainly not a fuel for a motor vehicle, and "resistance to attack" is not the same as impermeability.

Thus, one skilled in the art would not be led to the present invention by this reference. If anything, one skilled in the art would be motivated to use a PTFE thickness of at least 10 times the thickness of the present PTFE coatings. Thus, this reference actually teaches away from the present invention.

Hence, this ground of rejection is believed to unsustainable and should be withdrawn.

Claims 1, 4, 6, 12, 18, 19, 27 and 28 stand rejected under 35 USC 102(b) as being anticipated by Martucci (US 5,170,011). However, this reference clearly fails to either disclose or suggest the present invention.

Notably, Martucci, much like Washizu, describes a composite having an inner layer of expensive fluoropolymer such as a polytetrafluoroethylene. Martucci describes an outer layer of polyamide on the inner layer of the PTFE.

However, in contrast the present invention uses inexpensive plastic or rubber as a base portion with only a mere coating of polytetrafluoroethylene on the inside of the part in contact with hydrocarbon fuel in order to render the portion of rubber or plastic much less permeable to hydrocarbon vapor.

Martucci teaches the use of an inner layer of PTFE, among other resins, in order to provide resistance to both chemical and heat degradation, thereby allowing automotive fuels to pass through the inner liner "without corroding or degrading the inner liner." See col. 2, lines 42-43. Thus, this reference, like Washizu, says virtually nothing about reducing hydrocarbon emissions through a part housing or transporting fuel.

Further, Martucci describes a wall thickness of the inner layer of between 0.001 and 0.120 inches, Which is up to about 2,500 microns in thickness. See col. 2, lines 45-46. The outer layer is polyamide, typically a nylon. See col. 3, lines 1-42. Thus, the thicknesses of the inner layer of Martucci are generally greater than those of the present PTFE coatings. Further,

the present invention utilizes plastic or rubber part portions which have PTFE on the fuel side. Polyamide is not a plastic or rubber, but is considered a fiber due to the high degree of crystallinity thereof. See Principles of Polymerization by Odian at page 35.

Clearly, one skilled in the art would be neither enabled or motivated from this reference to obtain the present invention.

Hence, this ground of rejection is believed to be unsustainable and should be withdrawn.

Claim 16 stands rejected under 35 USC 103(a) as being unpatentable over Washizu in view of Andre (US 5,799,704). However, Andre fails to correct the deficiencies of Washizu.

Notably, Andre has merely been cited as teaching that chloroprene and nitrile PVC are known as equivalent materials and may be added as outer rubber layers in fuel hoses. However, Andre also fails to either disclose or suggest the use of a thin PTFE coating on conventional parts made of plastic or rubber to effectively control hydrocarbon emission.

Clearly, this reference fails to correct deficiencies of the former cited references. One skilled on the art would be neither enabled nor motivated fun even the combined teachings of the cited references to make and use the present invention.

Hence, this ground of rejection is also believed to be unsustainable and should be withdrawn.

Claims 1, 4, 5 and 13-17 stand rejected under 35 USC 112, first paragraph.

However, in view of the above amendments this ground of rejection is believed to be moot.

Claims 6-10, 18, 20, 22-29, 32 and 33 stand rejected under 35 USC 112, first paragraph.

However, in view of the above amendments this ground of rejection is believed to be moot.

Claims 12 and 19 stand rejected under 35 USC 112, first paragraph.

However, in view of the above amendments this ground of rejection is believed to be moot.

Finally, Claim 1 stands objected to in view of the informality as noted at page 2 of the

Official Action.

However, in view of the above amendments this ground of rejection is also believed to be moot.

Finally, entry of this Amendment is urged as appropriate under MPEP 714.12 inasmuch the Amendment is believed to place this case in condition for allowance. No additional claims have been added.

Accordingly, in view of the above, it is now believed that the present application now stands in condition for allowance. A notice to this effect is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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